

**DRAFT**

**Big Cane**

**Conservation Area**

**Ten-Year Area Plan**

**FY 2017-2026**



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## OVERVIEW

- **Official Area Name:** Big Cane Conservation Area #8014
- **Initial Acquisition:** 1980
- **Acres:** 2,154 acres
- **County:** Butler
- **Administrative Responsibility:** Forestry
- **Maintenance Responsibility:** Forestry
- **Statement of Primary Purpose:**

### A. Strategic Direction

To manage and sustain the existing bottomland forest, stream, swamp, and shrub swamp natural communities; and enhance the quality of wildlife habitat for a variety of species through forest management. Emphasis will be on managing forest and wetland wildlife that occur in the lower Black River forested wetlands.

### B. Desired Future Condition

The desired future condition is a diverse bottomland hardwood forest habitat that will support and sustain all of the area's natural communities and associated wildlife; provide a productive and diverse fishery; and provide opportunities for the public to use and enjoy the area's natural resources.

### C. Federal Aid Statement

N/A

## GENERAL INFORMATION AND CONDITIONS

### I. Special Considerations

- A. **Priority Areas:** Big Cane Creek Aquatic Conservation Opportunity Area, Coon Island Aquatic Conservation Opportunity Area, Big Cane Alluvial Plain Terrestrial Conservation Opportunity Area
- B. **Natural Areas:** None

### II. Important Natural Features and Resources

- A. **Species of Conservation Concern:** Species of conservation concern are known from this area. Area Managers should consult the Natural Heritage Database annually and review all management activities within the Natural History Biologist.
- B. **Caves:** None
- C. **Springs:** None
- D. **Other:** Natural communities on this area include wet and wet-mesic bottomland forests. Swamp and shrub-swamp communities occur along the shallow oxbow and along backwater areas of Big Cane Creek. Five shallow wetland ponds were created

in 1999 through 2004 to create habitat for a Missouri endangered species and wetland species.

### **III. Existing Infrastructure**

- Eight gravel parking lots
- Three campsites, no amenities
- 2.5 miles of gravel road
- Gravel boat ramp (at Cane Creek Access)
- Concrete boat ramp (at Cane Creek Ditch)

### **IV. Area Restrictions or Limitations**

- A. Deed Restrictions or Ownership Considerations:** None
- B. Federal Interest:** Federal funds may be used in the management of this land. Fish and wildlife agencies may not allow recreational activities and related facilities that would interfere with the purpose for which the State is managing the land. Other uses may be acceptable and must be assessed in each specific situation.
- C. Easements:** None.
- D. Cultural Resources Findings:** No known cultural resources.
- E. Endangered Species:** Endangered species are known from this area. Area managers should consult the Natural Heritage Database annually and review all management activities with the Natural History Biologist.
- F. Boundary Issues:** Establishing accurate and identifiable boundary markers is a priority for this property.

## **MANAGEMENT CONSIDERATIONS**

### **V. Terrestrial Resource Management Considerations**

Big Cane Conservation Area (CA) and its surrounding area contain abundant forest and wetland habitat and wildlife species. There are 6,486 acres of bottomland hardwood forests/swamps (on public and private lands) in the immediate vicinity of Big Cane CA; this is one of the larger blocks of bottomland hardwood forest/swamp habitat left in southeast Missouri.

Wildlife populations are secure and abundant because of the large block of forested cover. Wildlife species using the area are typical of most Lower Mississippi Alluvial Valley forested wetlands. Mallard and other waterfowl use the area during winter and wood ducks are permanent residents. Herons, shorebirds, and forest interior songbirds use the forested cover and associated wetlands. Alligator snapping turtles, many amphibians, and reptiles use the channels, sloughs, and Big Cane Creek. Deer, turkey, squirrels, and

cottontail and swamp rabbits use the forest and some of the old fields that were planted to trees on the area. Many other species of wildlife depend on this forested wetland habitat.

Big Cane CA includes several areas that have been designated as Conservation Opportunity Areas by the Missouri Department of Conservation (the Department). The Big Cane Alluvial Plain Terrestrial Conservation Opportunity Area (13,542 acres) surrounds Big Cane CA (Figure 2). It is a Conservation Opportunity Area because of its wetlands and wetland forest; high number of species of conservation concern and natural communities; and proximity to Department-owned land, Wetland Reserve Program land, or other private forested lands. The Big Cane Creek Aquatic Conservation Opportunity Area (11,181 acres) and the Coon Island Aquatic Conservation Opportunity Area (8,278 acres) surround Big Cane CA (Figure 3). These areas are designated Conservation Opportunity Areas because of an abundance of species of conservation concern and natural communities, high quality alluvial stream meanders, and connectivity to nearby Coon Island CA.

The conservation area consists of two forest management compartments: Compartment 1 (with 22 stands) and Compartment 2 (with 23 stands). Dominant tree species include pin oak, willow oak, nuttall oak, over-cup oak, and hickories. Other tree species present include bald cypress, swamp chestnut oak, cherry-bark oak, water oak, slippery elm, black gum, water tupelo, green ash, and sugarberry. Most of the merchantable timber was removed before the Department purchased the area in 1980. Forests were thinned on about 1,000 acres of the area from 1984 through 2014. The stands are currently in saw timber and large pole-sized growing stock. A total of 684 acres, previously cleared before purchase, were reforested with native bottomland tree species. Many of these stands have been thinned to improve species diversity and control density. The dominant soil is the Calhoun series, a poorly drained bottomland soil having a site index of 80 for pin oak (Appendix A).

This predominantly forested area is a remnant of the bottomland forest that originally covered most of the Missouri Bootheel region. Historically, the area was flooded from annual high-water events on Big Cane Creek and Black River. Cane Creek Ditch now diverts most floodwater into Black River, 1 mile south of the area. In very wet years, when Black River levels are high, water backs onto the area from Cane Creek Ditch. Almost no overflow presently occurs from Big Cane Creek. Lower depressions on the area collect rainwater and some overflow occurs from Cane Creek Ditch in winter and spring.

**Challenges and Opportunities:**

- 1) Manage and improve bottomland hardwood forests for a variety of wildlife species.
- 2) Maintain drainage on the area. Repair damage caused by beavers.
- 3) Continue oak regeneration research.
- 4) Maintain area wetlands.

**Objective 1:** Manage bottomland hardwood forest for a species mix characteristic of the natural communities.

**Strategy 1:** Follow the Southeast Region Forest Inventory schedule and inventory each compartment on a 10-to-20-year re-entry. (Forestry)

**Strategy 2:** Develop and implement forest management actions (harvest and forest thinning) from inventory data, as budget and time constraints allow. (Forestry)

**Strategy 3:** Uneven aged (or all aged) harvests and forest thinning will be used to create forest habitat conditions suitable for wetland forest wildlife species. A long term goal is to have 35 to 50 percent of forested acres meet the desired stand structure conditions. See “Management of Bottomland Hardwood Forest” (Table 2) in *Restoration, Management and Monitoring of Forest Resources in the Mississippi Alluvial Valley: Recommendations for Enhancing Wildlife Habitat* (Wilson, Ribbeck, King, & Twedt, 2007) (Figure 5). (Forestry)

**Strategy 4:** Continue the “Old Growth” designation for the wet-mesic bottomland forest in Compartment 1, Stand 4 (60 acres), Stand 18 (10 acres); and Compartment 2, Stand 14 (51 acres). (Forestry)

**Strategy 5:** Continue the process of precommercial thinning on all 20-to-25-year old tree plantings. Use desired forest condition guidelines (Figure 5) to maintain species diversity. (Forestry)

**Strategy 6:** Continue cane release project (see area managers files) on Stand 19 (Compartment 2). (Forestry)

**Objective 2:** Maintain and restore drainage on the area that will sustain current natural communities.

**Strategy 1:** Control the beaver population and remove beaver dams that impede water flows and create high-water (ponding) conditions into the growing season. (Forestry)

**Strategy 2:** Maintain natural drainage patterns with a series of culverts and low water dips in the Section 36 loop road. (Forestry, Design and Development)

**Objective 3:** Continue the oak regeneration release harvest research (see Area manager files) in Stand 19 (Compartment 1).

**Strategy 1:** Maintain measurement plots and assist principal investigator in re-measurement through end of project. (Forestry)

**Strategy 2:** Assist the Natural History Biologist (or Natural Areas Coordinator) in conducting bird monitoring to establish bird population response to management in Stand 19 harvest. (Forestry)

**Objective 4:** Maintain the five shallow wetlands in Compartment 2, Stands 20 and 21 for reptile and amphibian habitat.

**Strategy 1:** Maintain access to the ponds through established lanes. Maintain mitigation survey markers around the ponds. (Forestry)

**Strategy 2:** Periodically sample the ponds for reptiles and amphibians with the state herpetologist. (Forestry and Resource Science)

## **VI. Aquatic Resource Management Considerations**

Fisheries management potential is limited on the area. Permanent surface water is found in a few sections of Cane Creek, a small oxbow, and Cane Creek Ditch. Most of the water in Cane Creek is diverted into Cane Creek Ditch several miles north of the area. As a result, there is very little water movement and turbid water in the old channel.

Cane Creek Ditch provides habitat for lowland fish species, such as channel catfish, freshwater drum, carp, smallmouth buffalo, and bigmouth buffalo. Big Cane Creek has small populations of sunfish, largemouth bass, and crappie. On occasion, water levels have become low and resulted in fish kills.

### **Challenges and Opportunities:**

- 1) Manage area fishery to provide public fishing opportunities.
- 2) Monitor aquatic species of conservation concern found on the area.

**Objective 1:** Manage fishery resource to provide unique angling opportunities.

**Strategy 1:** Maintain two access point boat ramps (CR 276 Big Cane ditch boat ramp and gravel ramp on Cane Creek (state line road) to provide fishing opportunities to Big Cane ditch and Big Cane creek. (Forestry)

**Strategy 2:** Monitor fish populations and stream quality periodically. (Fisheries)

**Objective 2:** Monitor fish species of conservation concern.

**Strategy 1:** Monitor fish species of conservation concern on the area on a regular basis. (Fisheries)

## VII. Public Use Management Considerations

### **Challenges and Opportunities:**

- 1) Provide fishing, hunting and recreational opportunities for the public.

**Objective 1:** Maintain current fishing, hunting and recreational access.

**Strategy 1:** Provide primitive camping on a walk-in basis. Allow camping in some parking lots during firearms deer season. (Forestry)

## VIII. Administrative Considerations

### **Challenges and Opportunities:**

- 1) Maintain area infrastructure.

**Objective 1:** Maintain area infrastructure in accordance with Department standards.

**Strategy 1:** Maintain current parking lots and boat ramps. (Forestry, Design and Development)

## MANAGEMENT TIMETABLE

Strategies are considered ongoing unless listed in the following table:

	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
<b>Terrestrial Resource Management</b>										
<i>Objective 1</i>										
Strategy 1							X			
Strategy 2								X		

## APPENDICES

### Area Background:

In 1960 Armstrong Cork Company acquired the 1,313 acres that would later become the first block of the conservation area. The intention was to cut all the merchantable timber from the land and establish improved cottonwood or other poplar plantations. In 1965 most of the merchantable timber was cut off this tract. In 1974, Armstrong Cork traded this tract to Westvaco Corporation for other lands near Armstrong holdings in South Carolina. Westvaco eventually decided this tract was too far from there Wickliffe Kentucky mill and in 1979 traded the land to First Royal Enterprises. By 1975 most of the forest land around this area had been cleared for agriculture. In 1980, the land was sold to the Missouri Department of Conservation along with other holdings in Butler County. The additional tracts were added to the area from 1981 through 1995.

### Current Land and Water Types:

Land/Water Type	Acres	Miles	% of Area
Forest and woodland	2,093		97
Wetland	61		3
Total	2,154		100
Stream frontage		6.5	

### References:

Wilson, R., Ribbeck, K., King, S., & Twedt, D. (Eds.). (2007). *Restoration, management and monitoring of forest resources in the Mississippi Alluvial Valley: Recommendations for enhancing wildlife habitat*. Lower Mississippi Valley Joint Venture Forest Resource Conservation Working Group.

### Maps:

- Figure 1: Area Map
- Figure 2: Terrestrial Conservation Opportunity Area Map
- Figure 3: Aquatic Conservation Opportunity Area Map
- Figure 4: Big Cane Conservation Area Boundaries and Stands Map
- Figure 5: Land Cover Map
- Figure 6: Desired Forest Conditions for Lower Mississippi Valley

### Additional Appendices:

- Appendix A: Soils Information

**Figure 1: Area Map**

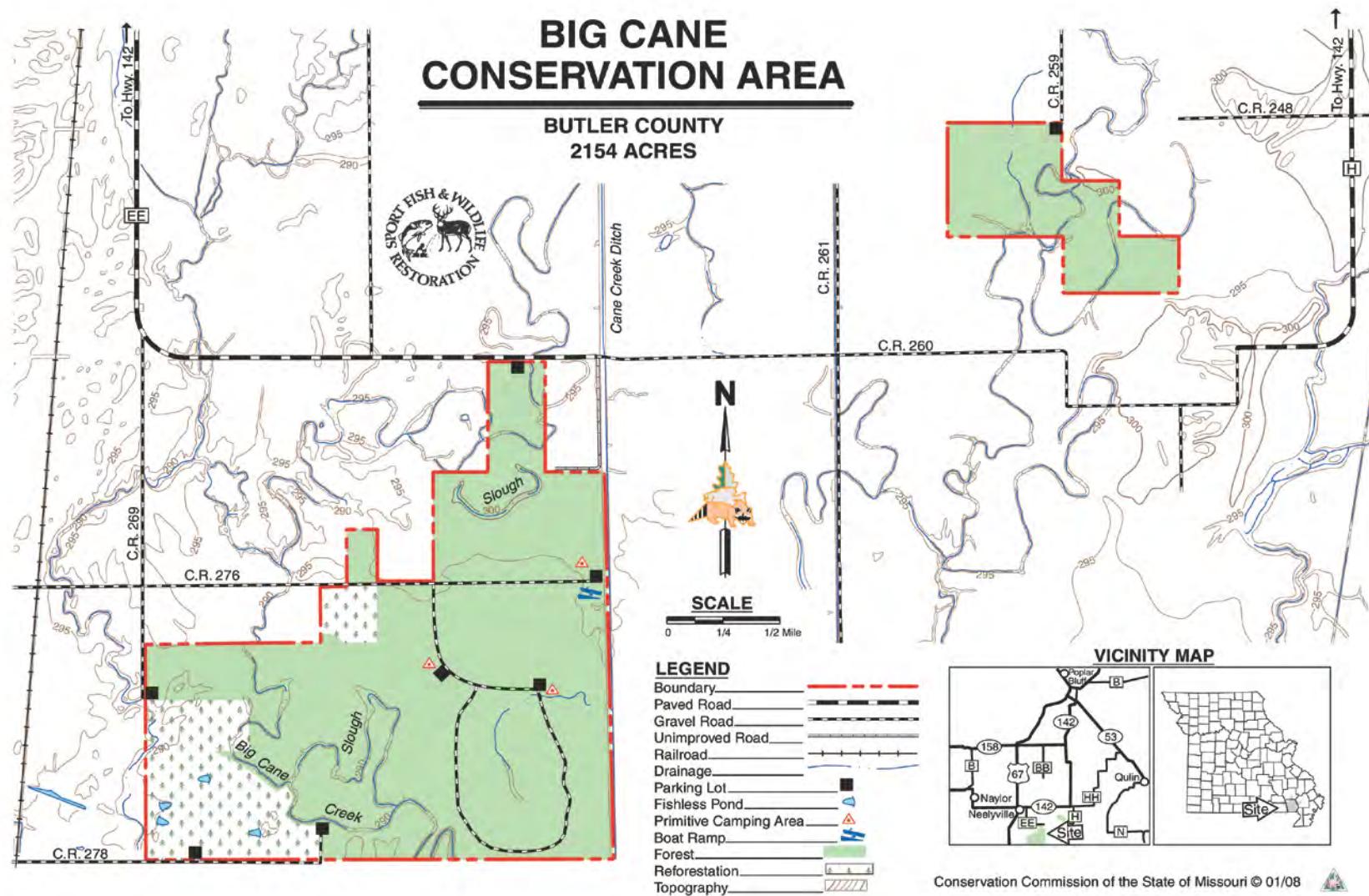


Figure 2: Terrestrial Conservation Opportunity Area Map

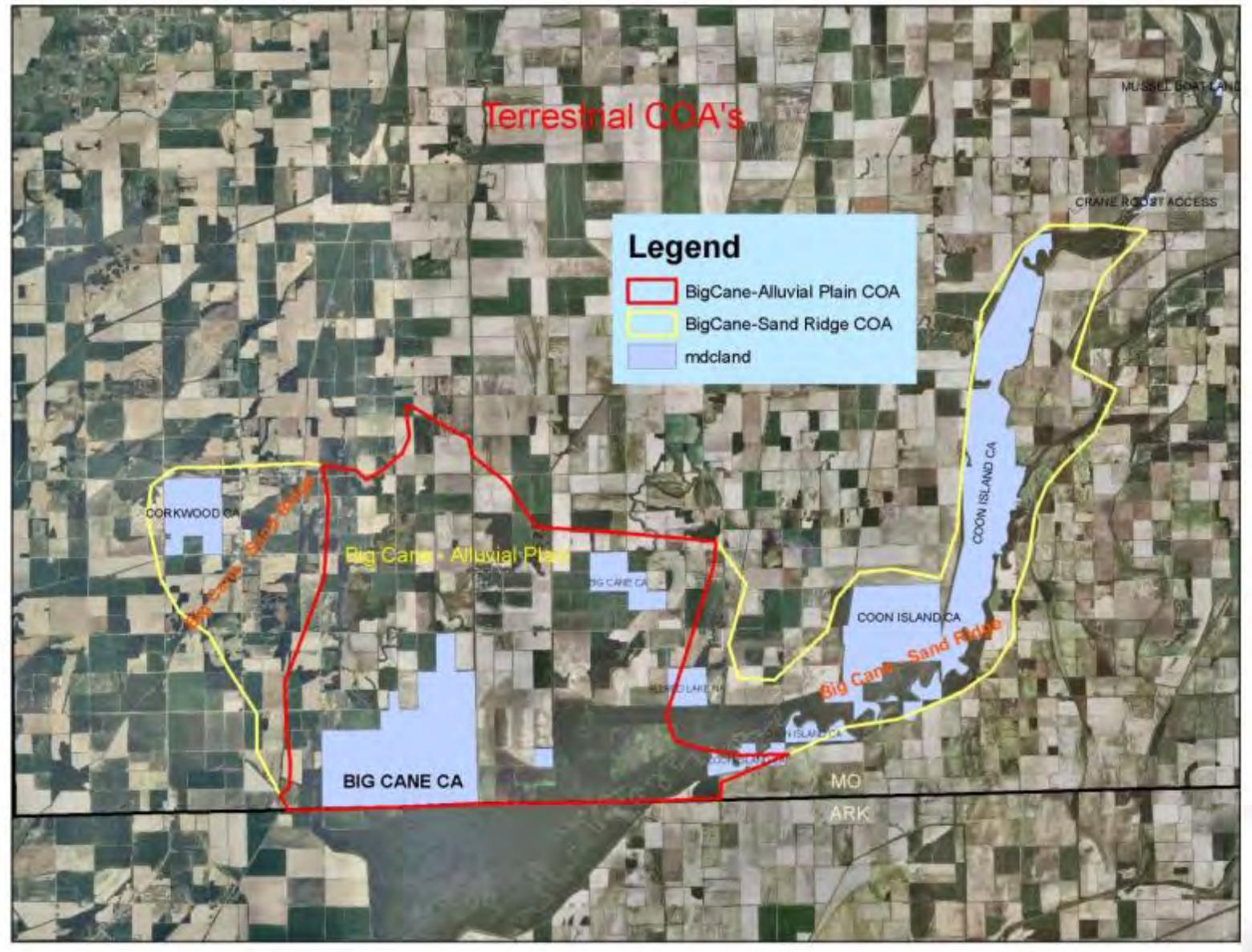


Figure 3: Aquatic Conservation Opportunity Area Map



Figure 4: Big Cane Conservation Area Boundaries and Stands Map

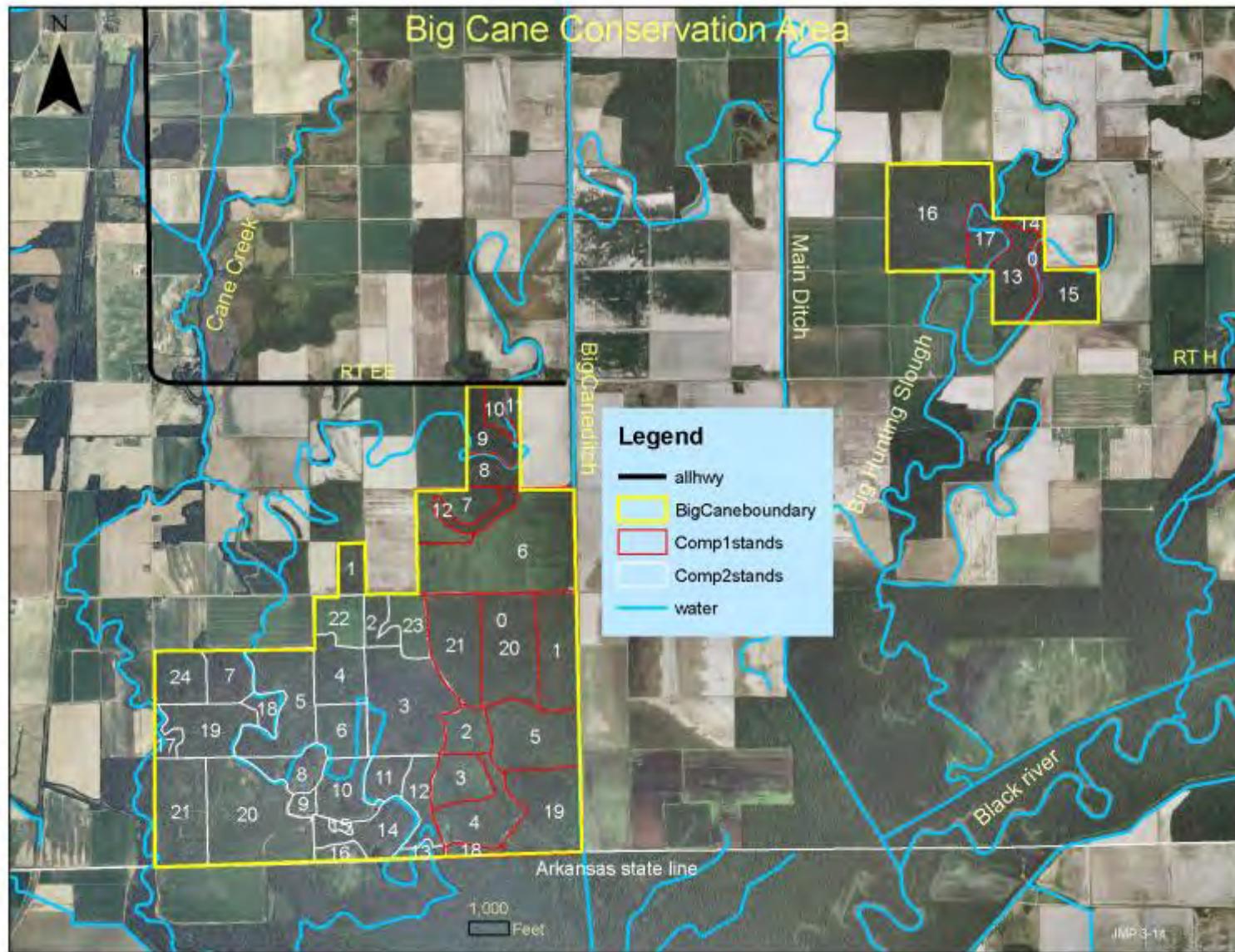


Figure 5: Land Cover Map

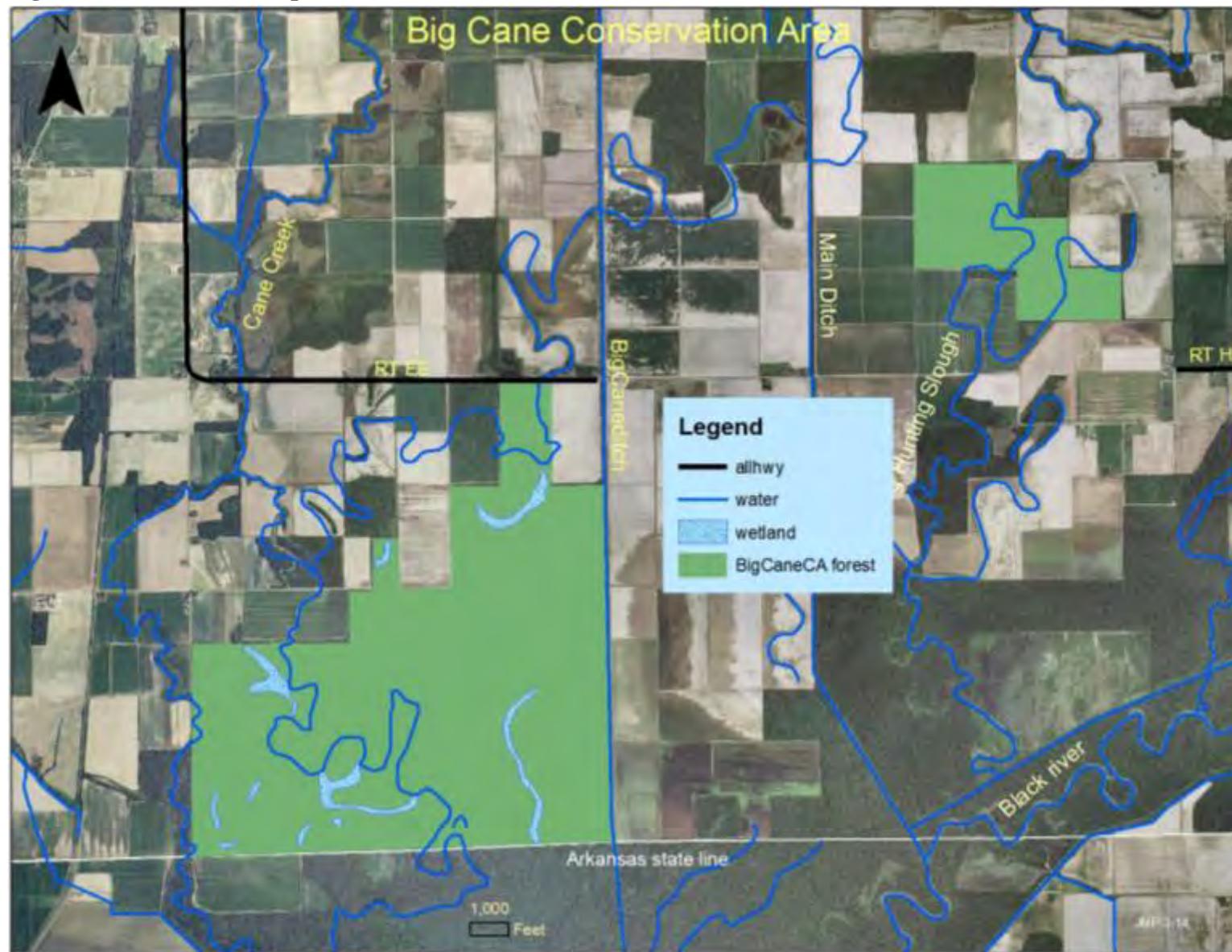


Figure 6: Desired Forest Conditions for Lower Mississippi Valley



# Desired Forest Conditions

## within Bottomland Hardwood Forests in the Mississippi Alluvial Valley

Forest Resources Conservation Working Group, Lower Mississippi Valley Joint Venture



### Priority Wildlife Species

Our objective is to provide forest habitat capable of supporting sustainable populations of all native species within the Mississippi Alluvial Valley. However, forest loss, fragmentation, and hydrological change has markedly altered habitat conditions within bottomland forests. Of particular concern are species such as Ivory-billed Woodpecker, Louisiana black bear, and several forest interior songbird species that have been negatively impacted by these forest changes. Thus, we advocate forest conditions that are conducive to the viability of a suite of priority wildlife species.

### Desired Landscape Condition

Habitat Type	% of Area	Description
Forest Cover	70 – 100%	Forest (habitat with >25% tree crown coverage) in a matrix of large patches and closely associated forest fragments, of which 35 - 50% should meet "Desired Stand Conditions" at any point in time.
Actively Managed	70 – 95%	Forests that are managed via prescribed silvicultural treatments to meet desired stand conditions.
↳ Regenerating Forest	<10%	A subset of actively managed forests which targets regeneration of shade-intolerant trees on areas >7 acres via removal of >80% of forest canopy (e.g., clear-cuts). Areas are considered regenerating until canopy trees achieve 1/3 of their anticipated site-specific height.
↳ Shrub-Scrub	0 – 5%	Thamnic, semi-permanent or ephemeral woody vegetation – often represented by early seral (successional) forests that result from active forest management.
Passively Managed	5 – 30%	Areas that are representative of different forest types within which little or no anthropogenic silviculture occurs (e.g., wilderness, set-aside, or natural areas).

### WILDLIFE FORESTRY

Forest-dependent (silvicolous) wildlife are responsive to Landscape Quality and Site Quality. We define **Desired Forest Conditions** as forests meeting both Desired Landscape and Stand Conditions. Traditional forest management has focused on maximizing timber volume (lumber or pulp) through silvicultural methods that promote optimal growth and vigorous health of desired tree species. Often traditional silviculture is not optimal for silvicolous wildlife. Indeed, quality habitat for priority wildlife likely requires a sacrifice in timber production and retention of less healthy trees. Even so, commercially viable, wildlife-oriented silviculture using variable retention harvests can be used in conjunction with forest restoration and natural processes to achieve Desired Forest Conditions within bottomland hardwood forests.

### Landscape Condition

To address landscape scale habitat needs of priority wildlife species, we advocate local landscapes (>10,000 acres) should be extensively forested in a matrix of large blocks of contiguous forest and closely associated smaller forest fragments. Where possible forest corridors should link forest landscapes. Some area should be passively managed (i.e., set-aside as "unmanaged" controls). However, to ensure development of "Desired Stand Conditions" most forests should be actively managed using wildlife forestry silvicultural methods. Regeneration harvests of areas >7 acres (i.e., clear-cuts) should be restricted to <10% of the landscape and management should ensure some early successional (i.e., shrub-scrub) habitat is available.

### Stand Condition

Size, structure, and composition of forests are important parameters for predicting suitability for silvicolous wildlife. Many priority wildlife species favor structurally diverse and species rich forests which harbor large trees and frequent gaps in the canopy. These conditions provide suitable habitat for foraging and cover within all dimensions of the forest and provide a desirable blend of regeneration, maturity, and senescence of forest trees. The distribution and abundance of suitable forest habitat is largely dependent on disturbance. Historically, disturbances resulted from flood, fire, tornadoes, etc. Under current conditions, many of these disturbances are spatially and temporally restricted which, in combination with unsustainable forest management practices, have resulted in homogeneous, closed canopy forests with little structural diversity or understory vegetation. We advocate the use of wildlife forestry silvicultural practices to introduce disturbance to these forests and thereby stimulate development of "Desired Stand Conditions".

### Forest Restoration

Extensive forest restoration (e.g. Wetland Reserve Program) has provided progress toward landscape objectives. However, we recognize the previous restoration methods may not readily provide "Desired Forest Conditions". We recommend planting multiple species combining shade-intolerant, early successional species, shade-tolerant and/or hard-mast producing trees. Plantings, and natural colonization, should result in an average of >300 trees/acre within 3 years – preferably within a matrix of high stem density patches and canopy gaps with sparse stem density.

### Desired Stand Condition

Primary Factors <sup>1</sup>	Desired Structure	Conditions that may warrant management
Canopy cover	60 – 70%	>60%
Mid-story cover	25 – 40%	<20% or >50%
Basal area	60 – 70 ft <sup>2</sup> / acre (>25 older age class)	>90 ft <sup>2</sup> / acre (>60% older age class)
Tree stocking	60 – 70%	<60% or >90%
<b>Secondary<sup>2</sup></b>		
Dominant trees <sup>3</sup>	≥0.5/ac	≤0.25/ac
Under-story cover	25 – 40%	<20% or >60%
Regeneration <sup>4</sup>	30-40% of area	<20% of area
Woody debris <sup>5</sup>	≥200 ft <sup>3</sup> / acre (>10 inch diameter)	>100 ft <sup>3</sup> / acre
Small cavities <sup>6</sup>	>4 visible holes / acre (>10 inch diameter)	<2 visible holes / acre (>10 inch diameter & >30 in. deep)
Large cavities <sup>6</sup>	≥1 visible hole / 10 acres (>10 inch diameter & >30 in. deep)	<1 visible hole / 10 acres (>10 inch diameter & >30 in. deep)
Dead, dying, or stressed trees	>6 stems / acre (>10 cm diameter)	<4 stems / acre (>10 cm diameter)
<b>Stand Condition</b>		
Stand condition management actions directly impact stand condition for tree survival and forest structure diversity. Areas lacking canopy cover/timber affected by >20% of stand area		
Stand condition quality indirectly impacted by management actions. Pollution of air, water, and soil which must be encouraged where possible		
Trees with >25% of crown above general forest canopy (>1.5 m diameter) should receive greater emphasis on more intense steps (e.g., thinning)		
*Advanced regeneration of shade-intolerant tree species in sufficient numbers (ps. 600 trees/ha) to stimulate their succession to the final canopy		

## Appendix A: Soils Information

A brief description of Big Cane CA soil types is given below. These condensed descriptions are included for quick reference. Ninety-five percent of the area is in Calhoun silt loam soil type. Complete descriptions can be found on the internet at <http://soils.missouri.edu/survey/missouri.asp>.

Calhoun silt loam soil is formed from loess over silty alluvium and occurs on back swamps and stream terraces. Available water capacity is high and depth to water table is 0 to 9 inches. It is associated with bottomland trees with a land capability class of 3w.

### **86001—Calhoun silt loam, 0 to 1 percent slopes, occasionally flooded**

#### **Map Unit Setting**

*Mean annual precipitation:* 47 to 51 inches

*Mean annual air temperature:* 55 to 59 degrees F

*Frost-free period:* 200 to 242 days

#### **Map Unit Composition**

*Calhoun and similar soils:* 85 percent

*Minor components:* 10 percent

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#### **Description of Calhoun**

##### **Setting**

*Landform:* Backswamps

*Landform position (three-dimensional):* Talf

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Loess over silty alluvium

#### **Properties and qualities**

*Slope:* 0 to 1 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Poorly drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)

*Depth to water table:* About 4 to 9 inches

*Frequency of flooding:* Occasional

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 2.0 mmhos/cm)

*Available water capacity:* Very high (about 12.7 inches)

#### **Interpretive groups**

*Farmland classification:* Prime farmland if drained

*Land capability (nonirrigated):* 4w

*Hydrologic Soil Group:* C/D

*Ecological site:* Quercus palustris-Liquidambar styraciflua/Vitis-Cornus foemina/Carex-Impatiens (F131AY003MO)

*Other vegetative classification:* Trees/Timber (Woody Vegetation)

#### **Typical profile**

*0 to 6 inches:* Silt loam

*6 to 25 inches:* Silt loam

*25 to 50 inches:* Silt loam

*50 to 80 inches:* Silt loam

### **Minor Components**

#### **Forestdale**

*Percent of map unit:* 5 percent

*Landform:* Stream terraces

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Ecological site:* Quercus phellos-Quercus michauxii/Cornus foemina-Vitis/Carex-Pilea pumila (F131AY004MO)

*Other vegetative classification:* Trees/Timber (Woody Vegetation)

#### **Foley**

*Percent of map unit:* 5 percent

*Landform:* Stream terraces

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Ecological site:* Quercus stellata-Nyssa sylvatica/Ilex decidua-Aesculus pavia/Claytonia virginica-Asplenium platyneuron (F131AY002MO)

*Other vegetative classification:* Trees/Timber (Woody Vegetation)

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